

[4910-13-U]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [63 FR 19175 No. 74 04/17/98]

[Docket No. 95-CE-92-AD; Amendment 39-10468; AD 98-08-19]

RIN 2120-AA64

Airworthiness Directives; Twin Commander Aircraft Corporation 500, 600, and 700 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule

SUMMARY: This amendment adopts a new airworthiness directive (AD) that applies to all Twin Commander Aircraft Corporation (Twin Commander) 500, 600, and 700 series airplanes. This AD requires installing access holes in both wing leading edges and repetitively inspecting the forward attach brackets and straps for cracks. Reports of cracks in the wing to fuselage attachment brackets and straps, wing station (WS) 24, and fuselage frames prompted this action. The actions specified by this AD are intended to detect cracks at the wing to fuselage attach points, which, if not detected and corrected, could cause structural failure and loss of control of the airplane.

DATES: Effective May 18, 1998.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of May 18, 1998.

ADDRESSES: Service information that applies to this AD may be obtained from Twin Commander Aircraft Corporation, P. O. Box 3369, Arlington, Washington, 98223; telephone (360) 435-9797; facsimile: (360) 435-1112. This information may also be examined at the Federal Aviation Administration (FAA), Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 95-CE-92-AD, Room 1558, 601 E. 12th Street, Kansas City, Missouri 64106; or at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Jeffrey Morfitt, Aerospace Engineer, FAA, Seattle Aircraft Certification Office, 1601 Lind Ave. S.W., Renton, Washington, 98055-4056; telephone (425) 227-2595; facsimile (425) 227-1181.

SUPPLEMENTARY INFORMATION:

Events Leading to the Issuance of This AD

A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an AD that would apply to Twin Commander 500, 600, and 700 series airplanes was published in the **Federal Register** as a notice of proposed rulemaking (NPRM) on August 19, 1997, (62 FR 44096). The NPRM was the result of reports of cracks in the wing to fuselage attachment brackets and straps, wing station (WS) 24, and fuselage frames. The NPRM proposed to require:

	A	B	C
PART I	<p>Installing access holes in left and right wing leading edges and inspecting the forward attach brackets and straps for cracks.</p> <p>For any airplanes that have wings modified with titanium leading edges through an STC, remove the wing root fairings to accomplish the required inspections, in lieu of installing the access holes.</p>	If cracked, prior to further flight, replacing the brackets and straps or repairing the part with an approved repair scheme. Then accomplish PART II of this AD.	If no cracks, repeat the inspection at regular intervals until cracks are found, then accomplish PART II.
PART II	Inspecting for cracks on both wing leading edge closeouts, upper & lower return flange radius, fuselage frame where tee bracket attaches, inboard side of attach bracket and frame tee bracket.	If cracked, prior to further flight, replacing any cracked part or repairing the part with an approved repair scheme.	After repairing or replacing the damaged part, continuing to inspect at regular intervals.
PART III	Inspecting fuselage station (f.s.) 100 for cracks.	If cracked, prior to further flight, repairing with an approved repair scheme, and continuing to inspect at regular intervals.	If no cracks, repeating the inspection at regular intervals until cracks are found, then accomplishing PART III B of this AD.

Accomplishment of the proposed action as specified in the NPRM would be in accordance with the Compliance section and PART I, II, and III of the ACCOMPLISHMENT INSTRUCTIONS sections of Twin Commander Aircraft Corporation (Twin Commander) Service Bulletin (SB) No. 223, dated October 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Several comments were received in response to the proposed action. Due consideration has been given to the following comments.

Turbine engine versus reciprocating engine models

One commenter opposes the AD for reciprocating engine powered models. The commenter asks if turbine models have different loads than reciprocating engine powered models, suggesting that the AD should apply only to turbine models.

The FAA does not concur. The type of powerplant is not relevant. However, the turbine models are pressurized, which affects the configuration of the structure, and service reports indicate pressurization does affect cracking in the fitting. This effect is accounted for in the compliance times for Part III of the service bulletin. Cracks have been discovered in both pressurized and non-pressurized airplanes and in every structural configuration present in the airplane models listed in the proposed AD. The final rule will not change as a result of this comment.

Low level survey versus non-survey operations

Two commenters oppose the proposed action for airplanes that are not used for low level survey operations. The commenters ask if the airplanes found cracked are engaged in low level survey operations, suggesting that the proposed action apply only to airplanes operated in such a manner.

The FAA does not concur. FAA data indicates that 6 of 47 airplanes inspected were in survey operations for a portion of their total hours of operation. All six showed cracking. The data indicates that 24 additional airplanes were found cracked. These airplanes were not engaged in survey operations for a significant portion of their total hours of operation. The service data supports the need for the proposed action regardless of whether the affected airplane is used in a low level survey type operation. The final rule will not change as a result of this comment.

Evidence of an unsafe condition

One commenter suggests that there is insufficient evidence of an unsafe condition to justify the proposed action. The commenter asks if the basis for this action was the 1978 Calumet, Oklahoma accident involving an in-flight structural breakup, suggesting that one accident that occurred 19 years ago does not justify an AD.

The FAA does not concur. While this accident is a source of concern, there is more evidence that an unsafe condition exists. There have been 14 other in-flight breakups that involved leading edge failures, as well as 8 incidents involving in-flight damage to the wing leading edge. One other accident is currently under investigation by the National Transportation Safety Board. These accidents and incidents demonstrate the critical nature of the leading edge on these airplane models. The numerous reports of cracking (63 percent of the inspected airplanes) indicate that an unsafe condition exists. The final rule will not change as a result of this comment.

Cracks due to poorly manufactured or improperly installed parts

One commenter suggests that the cracks found in the bracket were due to overload during installation. The commenter asks the FAA to conduct a metallurgical analysis of the cracked parts.

The FAA does not concur. A metallurgical analysis has been conducted that shows that the crack propagation was fatigue, not installation overload. A developmental problem resulted in some early parts that did not fit correctly. However, the manufacturing process has been refined so that the fit problem has been alleviated. The final rule will not change as a result of this comment.

Airplanes equipped with titanium leading edges

One commenter suggests that the proposed action be changed to allow alternative inspection techniques that would not necessitate installing the access doors in airplanes that have a titanium leading edge modification for flight into known icing conditions, or exempt these airplanes from the proposed action entirely. The commenter states that the titanium leading edges installed per Supplemental Type Certificate (STC) on 23 of his airplanes cannot be modified as required by the service bulletin. The commenter also states that the leading edge modifications per this STC would add significant strength to the leading edge, suggesting that airplanes so equipped would not be susceptible to cracking.

The FAA partially concurs. The effect of the leading edge modification on the cracking, which is the subject of this AD, is unknown. However, stiffening of the leading edge could increase the load in the attachment bracket, thereby aggravating the situation. The unsafe condition is therefore likely to exist in airplanes with the titanium leading edges, and these airplanes should be included in the proposed action.

The leading edge access doors are installed to make the required inspections easier and less time consuming. The leading edge modification installed on the commenter's airplanes is unique. Because of the small number of airplanes affected by this modification, the FAA can address the requests for alternative methods of compliance, as necessary.

The FAA has also changed the requirement for gaining access to the wing leading edges for airplanes with wings modified by an STC with titanium leading edges. For these airplanes, the wing root fairings can be removed to accomplish the inspections for cracks.

The final rule will reflect these changes.

Need for terminating action

One commenter suggests that the proposed action be changed to include a modification that terminates the repetitive inspection requirements.

The FAA partially agrees. A modification to the airplane to terminate the repetitive inspections that are proposed would be desirable. However, neither the manufacturer, nor any other party has proposed a permanent fix to the cracking. The unsafe condition necessitates that the proposed action be taken at this time. If a terminating action should become available in the future, the FAA would incorporate it into a superseding AD. The final rule will not change as a result of this comment.

Work to be done at a Twin Commander Service Center

One commenter states that the service bulletin recommends that the work be done at a Twin Commander service center which could be difficult to schedule, given the limited service centers and the number of airplanes affected. The commenter states that requiring the modification be accomplished at these Twin Commander service centers would be a hardship for some owners.

The FAA partially agrees that it may be difficult for all of the owners/operators to schedule the work at a Twin Commander service center. Revision Notice No. 1 is included in the service bulletin that is incorporated by reference into the proposed action. This revision clarifies that it is recommended by the manufacturer, but not required, that the work be done by a Twin Commander service center. The final rule will not change as a result of this comment.

Projected cost impact unrealistically low

One commenter argues that the economic analysis reflected the cost per side, not the total cost and that the total cost quoted was unrealistically low.

The FAA does not concur. The type certificate holder verified that the hours quoted were for the entire airplane, not one side. The total inspection hours are based on

two prototype installations. The cost impact provided in the NPRM presents a conservative estimate of the time required for a mechanic to install two access doors and conduct a dye penetrant inspection. There will be additional cost if the inspection turns up cracked fittings or leading edge ribs. The additional cost of repairing damaged wing structure found by the inspections can not be determined, since it depends on the magnitude of the damage found and the repair technique used. The final rule will not change as a result of this comment.

The FAA's Determination

After careful review of all available information related to the subject presented above, including the related service information, the FAA has determined that air safety and the public interest require the adoption of the rule as proposed, except for the changes discussed above and minor editorial corrections. The FAA has determined that these changes and minor corrections will not change the meaning of the AD and will not add any additional burden upon the public than was already proposed.

Cost Impact

The FAA estimates that 1,464 airplanes in the U.S. registry will be affected by this AD, that it will take approximately 82 workhours for PART I; 100 workhours for PART II (if required); and 7 workhours for PART III per airplane (if required) to accomplish this action. The average labor rate is approximately \$60 an hour. Parts cost approximately \$410 for PART I and approximately \$450 for PART II (if required) per airplane. Based on these figures, the total cost impact for PART I will be \$5,330 per airplane, PART II (if required) will be \$6,450 per airplane, and PART III will be \$420 per airplane (if required). The U.S. fleet cost is estimated to be \$11,127,650, or \$5,950 per airplane if no damage is found; and \$23,021,400 for the U.S. fleet, or \$12,200 per airplane if damage is found. For purposes of estimating the cost of this AD, the FAA is presuming that none of the owners/operators have had any of the actions accomplished on any of the affected airplanes. In addition, the cost impact does not take into consideration the costs of the repetitive inspections. The FAA has no way of determining the number of repetitive inspections that may be incurred over the life of the airplane.

Regulatory Flexibility Act Economic Analysis

Because the estimated cost for the inspection and possible repairs are expensive, the FAA conducted a Cost Analysis and Initial Regulatory Flexibility Determination and Analysis for this AD.

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to assure that small entities are not unnecessarily and disproportionately burdened by Government regulations. The RFA requires agencies to review rules that may have a "significant economic impact on a substantial number of small entities," and, in cases where they would, to conduct a Regulatory Flexibility Analysis in which alternative actions are considered.

FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, defines "significant economic impact" as an annualized net compliance cost, adjusted for inflation, which is greater than a threshold cost level for defined entity types. A "substantial number" is defined as a number that is at least eleven and that is more than one-third of the small entities subject to a rule, or any number of small entities subject to a rule which is substantial in the judgment of the rulemaking official. "Small entities" are defined as small businesses, small not-for-profit organizations which are independently owned and operated, or airports operated by small governmental jurisdictions.

With limited information available to airplane specific costs, a range of per airplane costs can be estimated by constructing hypothetical low- and high-cost scenarios. These scenarios are based on three general presumptions: first, that these airplanes have

accumulated 6,000 hours TIS and are subject to this AD within the next 100 hours TIS; second, that all of these airplanes are at the minimum and maximum extremes of annual TIS (200 or 300 hours) with a remaining operating life of 10 and 20 years, and the extent of cracking is unknown (no cracking or cracking in the inspected areas); and third, that these airplanes are of the model types incurring either the lowest or highest costs.

The total low-cost scenario in 1997 dollars will be \$5,570 (\$4,805 discounted) per airplane over 10 years, with \$5,330 of the costs incurred in the first year. The annualized cost (again over 10 years) will be \$641 per airplane.

The total high-cost scenario in 1997 dollars will be \$25,285 per airplane (\$16,487 discounted) over 30 years, with \$15,865 of the costs incurred in the first year. The annualized cost (again over 30 years) will be \$1,556.

This AD will affect approximately 1,464 airplanes, of which 366 are owned by individuals, 38 are owned by federal and state agencies, and 847 are owned by 697 separate entities. Of the 697 entities, one entity owns 28 airplanes, three entities own between 10 and 12 airplanes, nineteen separate entities own between 3 and 9 airplanes, thirty-two entities own 2 airplanes, and six-hundred forty-two entities own 1 airplane each. The FAA cannot determine the size of all 697 owner entities, or the type of business each entity is engaged in. The FAA also cannot conclusively determine the costs of this AD. For illustration purposes, it has been calculated that the AD will have hypothetical annualized costs between \$641 (the low-cost scenario) and \$1,556 (the high-cost scenario) per airplane. Due to the uncertainties involved with these calculations, as well as with the ownership information, no determinations can be made regarding "significant economic impact on a substantial number of small entities."

The FAA has considered three alternatives to this AD: (1) take no federal action and rely on voluntary compliance with the Twin Commander Service Bulletin No. 223. The FAA finds this alternative unacceptable because of the consequences that could result, if the unsafe condition is not eliminated; (2) mandate inspecting fewer parts, and at longer intervals in the areas where the wings attach to the fuselage. This alternative is unacceptable because less stringent inspections could fail to locate cracking in key parts of the airplane for too long a period of time; (3) defer Federal action pending review of additional data to determine whether to require the specified inspections. This alternative is unacceptable because evidence already exists of cracking in the wing and fuselage at the attach points which would be considered structural failure.

Consequently, the FAA is unable to conclusively make an economic impact evaluation based on information available.

Regulatory Impact

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) could have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A copy of the final evaluation prepared for this action is contained in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption "ADDRESSES".

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. Section 39.13 is amended by adding a new airworthiness directive (AD) to read as follows:

98-08-19 TWIN COMMANDER AIRCRAFT CORPORATION: Amendment 39-10468; Docket No. 95-CE-92-AD.

Applicability: Models 500, 500A, 500B, 500S, 500U, 520, 560, 560A, 560E, 560F, 680, 680E, 680F, 680FL, 680FLP, 680FP, 680T, 680V, 680W, 681, 685, 690, 690A, 690B, 690C, 690D, 695, 695A, 695B and 720 airplanes, all serial numbers, certificated in any category.

NOTE 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (f) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated in the body of this AD after the effective date of this AD, unless already accomplished.

To prevent cracks at the wing to fuselage attach points, which, if not detected and corrected, could cause structural failure and loss of control of the airplane, accomplish the following:

- (a) For all models except Models 520, 560, 690C and 695, accomplish the actions in the following table in accordance with the Compliance section and PART I, II, and III of the ACCOMPLISHMENT INSTRUCTIONS sections of Twin Commander Service Bulletin No. 223, dated October 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997:

	A	B	C
PART I	<p>Upon the accumulation of 6,000 hours total time-in-service (TIS) or within the next 100 hours TIS, whichever occurs later, install access holes in left and right wing leading edges and inspect the forward attach brackets and straps for cracks.</p> <p>For any airplanes that have wings modified with titanium leading edges through an STC, remove the wing root fairings to accomplish the required inspections, in lieu of installing the access holes.</p> <p>(Accomplish in accordance with PART I of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.)</p>	<p>If cracked, prior to further flight, replace the brackets and straps or repair the part by an approved repair scheme (see paragraph (b) of this AD). Then, accomplish PART II of this AD.</p> <p>(Accomplish in accordance with PART I of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.)</p>	<p>If no cracks are found, repeat inspection at 1,000 hour (hr.) intervals until cracks are found, replace the cracked part or repair by an approved repair scheme (see paragraph (b) of this AD), then accomplish PART II.</p> <p>(Accomplish in accordance with PART I of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.)</p>

	A	B	C
PART II	<p>Inspect for cracks at the wing leading edge close-outs, upper & lower return flange radius, fuselage frame where tee bracket attaches, inboard side of attach bracket and frame tee bracket.</p> <p>(Accomplish in accordance with PART II of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997, and Revision Notice No. 2, dated August 18, 1997.)</p>	<p>If cracked, prior to further flight, replace any cracked part or repair the part with an approved repair scheme (see paragraph (b) of this AD). If no cracks are found, continue to repetitively inspect at 1,000 hour TIS intervals.</p> <p>(Accomplish in accordance with PART II of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.)</p>	<p>After repair or replacement is accomplished, continue to inspect at 6,000 hr. intervals.</p> <p>(Accomplish in accordance with PART II of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.)</p>

PART III	For pressurized airplanes, at 6,000 hr. total TIS or within the next 100 hours TIS whichever occurs later, inspect fuselage station (F.S.) 100 for cracks.	If cracked, prior to further flight, repair with an approved repair scheme (see paragraph (b) of this AD), and continue to inspect at 1,000 hr. intervals.	If no cracks, repeat inspection at 1,000 hr. intervals until cracks are found, then accomplish PART III B of this AD.
	For non-pressurized airplanes, at 12,000 hr. total TIS or within the next 100 hours TIS whichever occurs later, inspect F.S. 100 for cracks.	(Accomplish in accordance with PART III of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.)	(Accomplish in accordance with PART III of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.)
	(Accomplish in accordance with PART III of Compliance Section in Twin Commander SB 223, dated Oct. 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997.)		

(b) Obtain an FAA-approved repair scheme from the manufacturer through the Manager of the Seattle Aircraft Certification Office at the address specified in paragraph (f) of this AD.

(c) For Twin Commander Models 520 and 560 airplanes, upon the accumulation of 6,000 hours total TIS or within the next 100 hours TIS, whichever occurs later, accomplish PART II of the table in paragraph (a) of this AD. Accomplish PART III in accordance with the compliance times in the above table of paragraph (a). These models are excluded from the wing leading edge access hole installation in PART I of the table in paragraph (a) of this AD.

(d) For Twin Commander Models 690C and 695 airplanes, accomplish PARTS I and II in accordance with the compliance times in the above table of paragraph (a). These Models are excluded from PART III of the table in paragraph (a) of this AD.

(e) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

(f) An alternative method of compliance or adjustment of the initial or repetitive compliance times that provides an equivalent level of safety may be approved by the

Manager, Seattle Aircraft Certification Office, 1601 Lind Ave. S.W., Renton, Washington, 98055-4056. The request shall be forwarded through an appropriate FAA Maintenance Inspector, who may add comments and then send it to the Manager, Seattle Aircraft Certification Office.

NOTE 2: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Seattle Aircraft Certification Office.

(g) The inspections and installations required by this AD shall be done in accordance with the Twin Commander Service Bulletin No. 223, dated October 24, 1996 as amended by Revision Notice No. 1, dated May 8, 1997 and Revision Notice No. 2, dated August 18, 1997. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from Twin Commander Aircraft Corporation, P.O. Box 3369, Arlington, Washington, 98223. Copies may be inspected at the FAA, Central Region, Office of the Regional Counsel, Room 1558, 601 E. 12th Street, Kansas City, Missouri, or at the Office of the Federal Register, 800 North Capitol Street, NW, suite 700, Washington, DC.

(h) This amendment becomes effective on May 18, 1998.

FOR FURTHER INFORMATION CONTACT:

Jeffrey Morfitt, Aerospace Engineer, FAA, Seattle Aircraft Certification Office, 1601 Lind Ave. S.W., Renton, Washington, 98055-4056; telephone (425) 227-2595; facsimile (425) 227-1181.